Selected Forestry Initiatives

and their

Inventory Implications

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Table of Contents

Summary of Key Issues 2

Forestry Initiatives 7

1. Ecosystem-Based Management (EBM) 7
2. 2. Coastal Forest Challenges 11
3. 3. Interior Log Grade Changes 12
4. Forest and Range Practices Act 13
5. Defined Forest Area Management (DFAM), Forest Investment Account (FIA) and Sustainable Forest Management Planning (SFMP) 15
6. State of Forests Reporting 17
7. Future Forests 17
8. Other initiatives 19

This study is one of several support studies undertaken to inform the Inventory Program Review[1] Challenge Dialogue being led by the Ministry of Forests and Range with stakeholders.

The following initiatives were examined by Terje Vold with respect to their inventory implications using support documents, personal knowledge and interviews.

1. Ecosystem-Based Management (EBM)
2. Coast Forest challenges
3. Interior Log Grade Changes
4. *Forest and Range Practices Act*
5. Defined Forest Area Management (DFAM), Forest Investment Account (FIA) and Sustainable Forest Management Planning (SFMP)
6. State of Forests Reporting
7. Future Forests
8. Other

Additional interviews and support material review, as well as any comments received, will result in refinements to this initial draft.

[1] Copies of this report and other IPR documents can be obtained at: www.for.gov.bc.ca/hts/inventory_prog_rev.htm.

Summary of Key Issues

Based on an initial review of the above initiatives, the following are some key issues that emerged with an inventory focus:

TFL inventories (need for seamless coverage)

Legal provisions under FRPA, or expected under FRPA such as ecosystem-based management (EBM), and assessments and reporting on sustainable forest management, require a seamless forest inventory across the province including TSA and TFLs. Three issues related to TFLs is (1) accessing the inventories; (2) adjusting the inventories to match TSA inventories; and (3) obtaining the inventories in new parks that have/are being deleted from TFLs.

(1) Currently, it is very difficult for the Crown to access forest inventories on TFLs that were often paid for using public funds and/or were required as part of tenure agreement.

(2) Where TFL inventories are available, they are often done to a different standard than TSA inventories making assessments across Crown lands difficult; there is a need to both (a) adjust existing TFL inventories to match TSA inventories to enable seamless reporting (e.g., regarding age class), and (b) examine and revise TFL standards that are a particular problem (e.g., where >250 year old forest are not mapped yet required for EBM planning and reporting).

(3) Many newly established or announced protected areas were or are in TFLs and there is a risk that this information will be lost without efforts being made by government to retain these inventories.

Examples of the need for seamless forest inventory coverage including TFLs:

- assessing if legal government objectives have been met in support of Forest Stewardship Plans under the FRPA where the spatial area covered by the objective is shared by TSAs and TFLs (e.g., where a TFL and TSA share a landscape unit boundary subject to a non-spatial old growth retention requirement);

- undertaking subregional, landscape-level and watershed EBM planning in the Central and North Coasts and the QCI where a legal requirement is expected under FRPA to address EBM-related old forest retention requirements across a variety of scales;

- reporting on the state of BC's forests across the province (e.g.., how much old forests do we have by ecosystem type and how much is protected? What is the seral stage and species composition and how is it changing?)

- reporting on sustainable forest management over a plan area (e.g.., Kootenay-Boundary; Vancouver Island) or ecological unit (e.g.., ecoprovince/ecoregion and/or biogeoclimatic unit) in addition to a management unit (TSA or TFL).

Inventory all lands (including parks and inoperable areas)

Legal provisions under FRPA, or expected under FRPA such as ecosystem-based management (EBM), and assessments and reporting on sustainable forest management, require a seamless forest inventory across the province including parks and protected areas, inoperable lands and other lands outside the timber harvesting land base, and private lands. Issues related to this are: (1) updating very poor and out-of-date inventory coverage in many older very large parks; (2) obtaining and retaining inventory coverage for newer protected areas (e.g.., that were in TFLs or are being withdrawn out of the TFL as discussed earlier); (3) obtaining vegetation inventories in national parks; (4) refining or correcting coarse or inaccurate inventory coverage in areas believed to be inoperable when the inventory was last undertaken; (5) ensuring new inventory projects address all lands including parks and private lands, and (6) modeling disturbance in non-timber harvesting land base (projecting the inventory).

(1) Large older parks like Strathcona and Tweedsmuir have very poor inventory coverage yet contribute to meeting landscape unit objectives for old growth retention and other forest cover objectives that can impact access to the timber harvesting land base;

(2) As previously discussed, existing TFL inventories in new protected areas may be lost without an active effort by government to obtain this coverage from licensees;

(3) National parks in BC have relatively detailed vegetation inventories that need to be obtained to provide seamless inventory coverage and address forest cover objectives as discussed above;

(4) Many forest inventories were undertaken in the 1970s when very large general polygon mapping was undertaken for areas believed to be inoperable. In some areas, age class assignments are known to be inaccurate. Some of these areas are now contributing to timber supply, and these areas contribute towards meeting forest cover and old forest objectives. Refined mapping in these areas is needed given current forest management realities including legislative requirements under FRPA;

(5) New inventory projects should cover all lands in a given area including operable and inoperable areas, parks and protected areas, and private land. This will help ensure accurate reporting of the state of BC's forests provincially, regionally and locally where required.

(6) Areas not contributing to timber supply outside of the timber harvesting land base such as in inoperable areas and protected areas can be subject to natural disturbances such as fire and insects. Projecting the inventory to account for disturbance is important when assessing how these areas might contribute to meeting forest cover objectives, such as old forest retention, in the future.

Retaining the inventory "snapshot" (and refining objectives using the inventory)

BC's forests are dynamic with continuous changes due to fire, insects, harvesting and other disturbances. Existing forest cover objectives (e.g., old forest retention) and potential future objectives (e.g., tree species diversity) can be informed by pre-harvest forest cover inventory assessments. Existing forest cover objectives, and supporting Range of Natural Variation (RONV) estimates, have not always made good use of inventories as part of the assessment process. Part of the reason is lack of seamless coverage as discussed in the previous issues. If these issues can be resolved, and seamless coverage provided, forest cover objectives may be refined or developed based on more accurate information-based assessments using the inventory. For example, improved assessments of RONV for old forest retention, seral stage distribution and tree species composition using the inventory in relatively undisturbed areas (due to harvesting) by BEC to help refine or develop legal or policy-oriented objectives or targets that may be applied in FSPs or SFMPs.

When forest inventories are updated due to disturbance or growth, the pre-existing inventory information should not be lost. It is important to retain the historical record or "snapshot" of the inventory. This may be useful for a variety of assessment and reporting purposes now and in the future to monitor and assess trends (e.g., is tree species diversity changing in BC in 20 years across the landscape post-MPB in 2025 versus what it was before the epidemic occurred?)

Stand-level vs landscape-level inventory (coordinate use of ground samples)

The forest cover inventory was designed to be a landscape-level (or management unit-level) inventory rather than a stand-level inventory. Cost was a key reason where the number of ground samples (about 100 to 200) relative to entire management unit meant few stands were sampled in the field. A landscape-level forest inventory may be sufficient to support aspatial assessments but may be inadequate to address spatially explicit issues that are now more frequently arising.

Forest planning and timber supply assessments are now more sophisticated using GIS support tools that enable spatially explicit analysis based on individual forest cover polygons. In the absence of better information, stand-level or polygon-specific assessments are made using the landscape-level forest cover inventory.

Given the need for spatially explicit assessments and decision-making, consideration should be given to developing inventories that are more accurate at the stand-level. To reduce costs, this may be more readily possible if a variety of different ground-related sampling programs are reviewed and coordinated so that they support improvements to the inventory. For example:

- Cruise data where about $5 to 10 MM are spent each year for appraisal purposes in support of stumpage calculations;
- Permanent sample plots of which there are about 9,000 in BC;
- National forest inventory grid intersections of which there are about 2,400 including about 1,200 on forest lands;
- Site productivity field data in support of SIBEC, site productivity adjustments, etc;
- Inventory audit and VRI phase 2 ground samples;
- Stand level data in support of site plans and pre-harvest prescriptions;
- RESULTS data post-harvest to free-growing;
- Forest Resource Evaluation Program (FREP) ground samples that support effectiveness evaluations;
- Terrestrial Ecosystem Mapping (TEM) ground samples; and
- Other ground sampling and monitoring data.

Given GPS and relative ease now to permanently mark the location of sample plots for future data collection, a coordinated and integrated data collection approach could be designed to help ensure the above ground sample information is used to improve the stand-level accuracy of the forest inventory now and in the future.

Multi-layer inventory

Forest disturbances due to harvesting and insects are creating multi-layer stands where each layer in the forest needs to be inventoried and projected for growth and yield. Throughout BC, wildlife tree patches are frequently identified and reserved following clearcutting, and need to be mapped. On the coast, there is increasing use of variable retention where relatively high levels of stand retention are prescribed. Under "take or pay" policy, some licensees prefer to leave uneconomic trees and pay for them as part of the waste assessment. In MPB affected areas that are not harvested, the portion of

the mature forest that survives the epidemic needs to be tracked along with areas being regenerated.

Some MPB harvested areas may be very small (e.g., less than one hectare through small scale salvage) or selectively or surgically harvested to remove dead or susceptible mature pine, thereby leaving a multi-layer forest within a forest cover polygon. The need to track multiple-layers as part of the inventory suggests that more of a stand-level inventory as discussed previously may be needed in the future.

Other information critical to decision-making

The forest inventory needs to include, or be accurately aligned with, other key information that may be critical to forest management decision-making. For example, the location of resource roads which may help define those stands which are economically operable and those that are not. At-built roads reported under FRPA, other resource roads, and existing non-status roads need to either be part of the forest inventory or available in a format (such as the Digital Road Atlas) where it can be readily used with the forest inventory to undertake assessments including timber supply analysis.

Another example is legal government objectives under FRPA and policy objectives that guide current practice (e.g., from land use plans). Having a map layer(s) that show existing objectives is important to overlay with forest cover maps to support timber supply analysis, forest stewardship planning, sustainable forest management planning, site planning and decision-making.

Forestry Initiatives

Ideas or notes from reviewing documents and interviews.

1. Ecosystem-Based Management (EBM)

Background

In 2001, the 5 MM ha Central Coast LRMP table agreements included a commitment to ecosystem-based management (EBM) and the establishment of a Coast Information Team (CIT). The 2 MM ha North Coast LRMP and 1 MM ha Haida Gwaii/Queen Charlotte Islands Land Use Plan have also committed to EBM. There are a wide variety of interpretations of what EBM means where the concept has been applied in resource management.

In 2004, in order to develop a consistent approach to EBM in support of all three plan areas which total 8 MM ha, CIT prepared an *EBM Planning Handbook*. The EBM Planning Handbook and other EBM support documents are available at the CIT website: www.citbc.org/. The key tenets of EBM according to CIT: maintaining ecological integrity and improving human wellbeing. The CIT defines EBM as:

> *...an adaptive approach to managing human activities that seeks to ensure the coexistence of healthy, fully functioning ecosystems and human communities. The intent is to maintain those spatial and temporal characteristics of ecosystems such that component species and ecological processes can be sustained, and human well-being supported and improved.*

The EBM planning framework integrates conservation and socio-economic considerations. EBM planning is collaborative involving First Nations, local communities and stakeholders where information sharing is stressed.

EBM management direction includes (with example provided):

- *Goal* – protect ecological integrity
- *Objective* -maintain ecosystem and seral stage representation
- *Requirement*- assess current distribution of ecosystem types & seral stages
- *Target*- maintain 70% of the natural distribution of old forest in each ecosystem type
- *Indicator*- seral distribution in each ecosystem type.

EBM management direction is to be provided across planning scales:

- Territory/Subregion – LRMP area, First Nations land use plans
- Landscape –tactical planning over several watersheds through SRMPs or FSPs
- Watershed – tactical planning in a specific drainage (e.g., riparian reserves)
- Site – site plans where stand-level reserves are identified

The overall framework seeks low risk (precaution) at the territory/subregion while recognizing landscapes can be managed within low to moderate risk thresholds, and individual watersheds can be managed within low risk to high risk thresholds. For example, at the territory/subregion, at least 70% of natural distribution of old forest must be retained for each ecosystem type (low risk) at the site series level, at least 50% must be retained across all landscapes (moderate risk), and at least 30% must be retained across all watersheds (high risk).

Integral to EBM is adaptive co-management (ACM) involving monitoring and evaluating actions taken to implement the EBM plans, and making adjustments as required (e.g., if targets are not delivering the objectives).

Forest inventory (VEG/forest cover) implications based on review of documents:

- Forest cover, BEC, PEM (or TEM) mapping is identified in EBM as key information sources to support various levels of planning.
- Describing natural conditions through Range of Natural Variability (RONV) estimates for old forest retention and seral stage distribution is basis for identifying thresholds of risk (low, moderate and high).
- RONV estimates for old forests were based on estimates of natural disturbance intervals rather than use of forest cover
    - Estimates of RONV of structure and disturbance in forest ecosystems vary by up to 29% depending on author.
    - They are also sensitive to choice of ecosystem classification where some express greater confidence in Site Series based on Predictive Ecosystem Mapping (SSPEM) whereas other use BEC variants and analysis units.
- Forest inventories help defined what's available for timber harvesting; for example, comparing current old forest retention with old forest retention target.
- Having reliable attribute information, such as age, species composition, etc. helps improve estimates of old forests (i.e. that exceed 250 years of age) and can improved TEM/PEM.
- EBM promotes use of spatially explicit timber supply analysis which depends more heavily on relatively reliable forest cover information at the stand-level than a non-spatial analysis.
- Forest cover mapping and site productivity estimates support timber supply impact assessments related to EBM alternatives at each planning scale that are an important part of the socio-economic assessment of implications on human wellbeing.

Forest inventory issues based on interview with A. MacKinnon and A. Hall:

1. EBM planning is at a variety of scales (e.g., subregional, landscape, watershed) where a seamless forest cover inventory is needed for the entire land base

(TFL/TSA, parks, operable/inoperable) so that the reporting out at each scale is using a common inventory data set

- The TFL inventories are done to a different standard than the TSA inventory and vary between TFLs (e.g., with different attributes for age class), and the TFL inventory is very difficult to access from TFL licensees in support of EBM planning. MOUs/use agreements with licensees to access TFL inventory can be difficult. Even if obtained, merging TFL with TSA data becomes a huge challenge given the different standards and attributes in place. For example, in one TFL, the "oldest" age class is over 200 years, whereas EBM requires old forest representation of stands >250 years of age.

- Licensee can effectively undertake EBM planning at the watershed level using their TFL inventory, but can't relate this to landscape or subregional EBM planning, which is required, without use of the TFL data sets (otherwise different inventory data sets are used, leading to inconsistent reporting)

2. TSA inventories were done about 30 years ago and are very generalized in areas believed at that time to be unmerchantable or inoperable such as low volume stands in the Hecate Lowland and higher elevations, and were not done in large parks like Tweedsmuir. Some of these non-park areas are now being harvested. EBM requires all stands to be reviewed at site series level with respect to meeting old forest targets and lack of information about these stands will hamper implementation.

   The lack of inventories in parks on Vancouver Island meant the landscape level planning for old forest retention required an inventory-like assessment be done in parks which added considerably to time and costs in completing the landscape level plans; a similar issues confronts EBM implementation

3. Over 1 MM ha of new protected areas are being designated as one outcome of the CC and NC LRMPs; many of these areas are in TFLs. The TFL deletion process (via s. 60 of Forest Act) or other arrangement needs to be made to secure the TFL inventories for these new protected areas as they will be needed to do EBM planning. (Note: the TFL inventory for the over 0.3 MM ha Kitlope protected area may have been irretrievably lost).

4. About $2.5 MM over 5 years, in large part using FIA funds, is being directed at TEM mapping for the Central and North Coast areas, to provide site series mapping. Site series is basis for old forest and seral stage representation, and also to identify red and blue listed ecosystems at risk (using CDC).

5. One critical attribute that VRI needs to provide is age class (e.g., which stands are over 250 years of age). Some of the older TSA mapping of lower productivity stands labeled them as less than 250 years of age whereas more recent TFL inventories are calling many of these stands over 250 years of age – if true, this significantly increases the amount of forests that can be harvested – which directly impacts timber supply review.

6. Another critical attribute in species composition. How good is the inventory in locating cedar, which is important to forest licensees and First Nations, and in locating hemlock/balsam stands which may be unmerchantable? Better information likely needed to address this key concern.

7. Concerns also existing about how accurate the inventory, based on mapping over 30 years ago, is in identifying the age and volume of second growth stands (since a number of coastal valleys were harvested many years ago) and their rate of growth.

8. TRIM base and forest inventory on QCI is generally poor which may hamper LRMP planning and EBM implementation.

2. 2. Coastal Forest Challenges

(Interview with Albert Nussbaum)

As the coast forest industry transitions from harvesting old growth to second growth, the level of information needed becomes more demanding, spatial, and stand-level. The challenge is to find economically operable old forest and second growth stands to operate in during the transition period.

Remaining old growth forests are relatively poorer quality and more costly to harvest and therefore increasingly on the "margin" of operability/merchantability. Identifying old growth stands that can be economically harvested requires better stand-level information on species composition and location of stand as it relates to accessibility (e.g., nearest road, distance to mill, slope/aspect). This spatial modeling can in turn improve timber supply review. For example, certain poor quality hemlock stands may need to be removed from the timber harvesting land base. Stands with cedar need to be relatively accurately identified given their importance for a variety of reasons. Helicopter logging has slowed down since the price of cedar is not as high as it was in the past, but markets could improve.

Similar stand-level information is needed to identify potential second growth stands that may be merchantable. Licensees are looking for particular stand characteristics including species composition and accessibility for these stands to be economically utilizable. For example, some of the older A-frame logging operations at the turn of the century (often adjacent to tidewater) may have second growth of merchantable age, but it may no longer be ecologically appropriate to haul these stands over coastal beaches and building new roads to access these isolated stands may be uneconomic.

Where harvesting is occurring on the Coast, there is increasing reliance on variable retention systems. This underscores importance of retaining in the inventory better information on both layers in the stand: the retained forest, and the regenerated forest.

(Note: a similar issue exists for MPB-impacted stands: continuing to characterize the stand that survived the epidemic, while characterizing the new growth).

(Note: particular challenges in Hypermartime Forests of Coastal BC have been recently documented www.for.gov.bc.ca/rni/Research/HyP3/hyp3-pg1.htm)

3. 3. Interior Log Grade Changes

(Interview with Grant Loeb and Keith Tudor)

Interior log grades were changed effective April 1, 2006 to reflect the potential value of the log scaled rather than whether the log came from a dead or live tree. (www.for.gov.bc.ca/mof/loggrade/). These changes were made because it was virtually impossible to determine at the scale if a log came from a dead or live tree, and the value at the mill of a log coming from a dead tree could be as great if not greater than a log coming from a live tree. Log grades now look more objectively at log-dependent attributes like checking. A substantive province-wide training program has promoted implementation of the new log grade system by scalers, industry and government.

The log grade changes meant that, on average, logs from MPB-killed stands would be charged more than minimum stumpage; whereas before only minimum stumpage was charged. The new log grade system, however, means that overall log grade prices are reduced to achieve similar revenue targets; so that licensees in general should not be paying more stumpage in the interior.

Stumpage is based not only on the value of scaled logged, but also on other factors such as the lumber recovery. It is recognized that lumber recovery decreases from green-attacked, to red-attack, to grey (killed) stands due to increased handling costs, breakage losses, etc. Lumber recovery factors are reduced by $1 for green-attacked stands, $10 for red-attacked stands, and $25 for grey (killed) stands which effectively means only $0.25 minimum stumpage is paid for grey stands. The condition of stands is based on cruise data.

Currently, industry relies heavily on red and green-attacked stands as a large part of fibre processed at mills. As the MPB epidemic continues, there is uncertainty regarding the extent to which the mills will be able to operate on lower quality grey stands – although the wood is firm, it may not be possible to economically make lumber from many of these stands.

The Net Volume Adjustment Factor (NVAF) destructive sampling is very important to Revenue Branch as part of appraisal system; this work needs to be supported.

About $5-10 MM is spent on cruising each year. There have been discussions in past in using this information to improve the forest inventory. Thinking outside the box, in theory it should not be a technical problem to do this, but it would be a huge information capacity issue. If cruise information or dollars could create more accurate, reliable stand level forest inventories, then cruising and related costs might not be necessary. There are models where inventory data, where reasonably reliable at the stand level, is relied on to address lumber recovery rather than the collection of additional cruise information.

About 60% of harvest in the interior is pine, and in some areas about 40% is hemlock/ balsam. Yet some of the hemlock/balsam stands may not be economically harvestable; getting reliable stand-level information on these stands may be critical to realistically assess future timber supply.

The model for making decisions about inventory priorities has widely fluctuated creating instability and uncertainty as well as less than optimal funding decisions. A model similar to what FRBC had eventually developed, where government and industry work together to collectively determine priorities is needed.

4. Forest and Range Practices Act

The key forest operational plan under FRPA is the Forest Stewardship Plan (FSP). One of the key content requirements of the FSP is to provide measurable or verifiable results or strategies consistent with established objectives. There are four kinds of established objectives:

- Grandparent objectives established under the Code;
- Land use objective under the *Land Use Objective Regulation* of the *Land Act;*
- Objectives in sections 5 to 10 of the *Forest Planning and Practices Regulation;*
- Objectives established under the *Government Actions Regulation.*

Established objectives may be qualitative (e.g., that a value is to be conserved) or quantitative (e.g., that so much of this attribute must be maintained). Values for which objectives are or may be provided include soils, timber, wildlife, biodiversity, fish, water, forage and associated plant communities, recreation, visual quality, resource features and cultural heritage resources.

An example of the interplay between established objectives, the FSP and the forest inventory is the Provincial Non-Spatial Old Growth Order

http://ilmbwww.gov.bc.ca/ilmb/lup/policies_guides/oldgrowth/index.html

Each landscape unit is given a high, intermediate or low biodiversity emphasis option (BEO) for which there is a corresponding requirement to retain a minimum percent old forest by biogeoclimatic zone by natural disturbance type (NDT) by age. For example, at least 14% of ICH in NDT 3 must be over 140 years of age in Moderate BEO landscape units.

In order to demonstrate this in their FSP, forest licenses will either have to spatially show the location of old forests retained to be consistent with this objective, or provide analysis that areas intended for harvesting would not cause the minimum targets to be breached. Either approach will likely require use of a relatively reliable and up-to-date forest inventory. The MOFR district manager will likely need to see this evidence before approving the FSP – and so too will equally want to ensure that the inventory is satisfactory.

Portions of some landscape units are in TFLs, TSAs and parks (national or provincial) – all of which contribute towards meeting the retention target. The boundaries of landscape units are usually based on heights of land and include inoperable areas. Where more than one licensee operates in a landscape unit (as is commonly the case in TSAs), the district manager may need to proportionally assigned old growth retention targets to each licensee (as provided for under FRPA). Having a reasonably seamless, consistent and accurate forest inventory throughout the landscape unit will be important to help ensure FSP consistency with the Provincial Non-Spatial Old Growth Order and to allow the district manager (where needed) to proportionally set targets in a reasonable and fair manner.

Other objectives related to wildlife and visual quality often include forest cover retention targets sometimes over very large areas where reliance on the forest inventory may be important to licensees who prepare the FSP and MOFR district managers who approve the FSP.

5. Defined Forest Area Management (DFAM), Forest Investment Account (FIA) and Sustainable Forest Management Planning (SFMP)[2]

The general intent of DFAM www.for.gov.bc.ca/hfp/dfam-website/ is to require and encourage volume-based forest licensees on TSAs to manage resource values under an area based approach. TSA forest licensee currently can voluntarily elect to use FIA www.for.gov.bc.ca/hcp/fia/ funding to undertake a timber supply analysis in support to Timber Supply Review; this is expected to be an obligation beginning in April 2007. The possibility of bringing key resource inventories as a core element under DFAM is being considered in part given strong links to timber supply analysis. If so, FIA would fund the necessary resource inventories as well as the timber supply analysis given direction to ensure any transfer of responsibilities is cost-neutral to industry.

To make this work, there would likely need to be defined minimum standards for the inventory, below which licensee(s) would be required to use FIA funds to improve the inventory.

In addition to the core obligations, DFAM is intended to provide a framework through incentives for collaborative management by TSA licensees and BCTS. Outside of legal framework of FRPA, many forest licensees prepare SFMPs using FIA funding, often in an effort to obtain certification (e.g., CSA SFM system requires a SFMP to be prepared and this system is recognized by SFI). SFMPs in TFLs often also serve as the Management Plan (MP) required under the *Forest Act*. SFMPs provide objectives for values (considering the strategic plan for the area) as well as measurable indicators and targets. www.for.gov.bc.ca/hcp/fia/landbase/strategic_resources_eligible_act.htm

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[2] This draft material has not yet been updated with information obtain from interviews held with Rick Brand and Dave Bodak of the Forest Sector Initiatives Section of the Ministry of Forests and Range. A later draft will include these perspectives.

A number of indicators have been used in SFMPs in BC; a "common ground for C&I of sustainable forests for BC" initiative www.forrex.org/bcci/default.asp with FORREX, Forest Practices Board, Tolko and many other agencies and licensees are reviewing approaches taken in an effort to develop a fewer number of accepted C&I. Many of the initially identified "common ground" C&I, which are linked to Canadian Council of Forest Ministers (CCFM) C&I framework for SFM, can directly involve forest inventory information including:

- Area of forest, by type and age class, in each ecozone
- Area of forest, by type and age class, soil types, and geomorphological feature types in protected areas
- Total growing stock of both merchantable and non-merchantable tree species on forest land
- Additions and deletions of forest area by cause
- Area of forest disturbed by fire, insects, pests, disease and timber harvest
- Proportion of timber harvest area successfully regenerated
- Net change in forest ecosystem carbon
- Forest ecosystem carbon storage by forest type and age class
- Forest area by timber tenure
- Coverage, attributes, frequency, and statistical reliability of forest inventories

Indirectly, or along with TEM/PEM, forest inventories can help address a number of other proposed "common ground" C&I including (e.g., by mapping extent of suitable habitat now and projected in future)

- The status of forest-associated species at risk
- Distribution of selected forest-associated species

One option being considered is for DFAM/FIA to provide more support or encouragement for licensees to develop SFMP given link to future forests initiative (see below). Some core C&I could be identified under FIA to help ensure key considerations are being consistently reported on in each management unit. The above "common ground" work could assist that effort.

6. State of Forests Reporting

The 1975 Royal Commission on Forest Resources recommended major changes to forest legislation which led to the 1979 *Forest Act* and *Ministry of Forests Act.* The later Act required that MOF undertake a comprehensive forest and range resource analysis every 10 years. The last one completed, the 1994 Forest, Range and Recreation Resource Analysis www.for.gov.bc.ca/hfd/library/frra/1994/index.htm made extensive use of the forest inventory. The Act was amended to delete this requirement replacing the intent with a policy requirement that MOFR develop report on the State of Forests in BC.

The in-progress 2004 State of BC's Forests report www.for.gov.bc.ca/hfp/sof/index.htm follows the CCFM C&I approach and needs a seamless provincial forest inventory coverage throughout the province, on TSAs, TFLs, parks, etc., in order to best describe forest conditions and trends in BC. A major obstacle in preparing the work to date was in the absence of forest inventory information for many TFLs and protected areas. This contributed significantly to the delay in getting the report more fully completed.

7. Future Forests

In December 2005, the Chief Forester hosted an inter-agency and multi-stakeholder workshop, including First Nations, on Future Forest Ecosystems in BC www.for.gov.bc.ca/hts/Future_Forests/. The workshop explored the ecological challenges associated with factors such as climate change, insect infestations, forest pathogens and wildfires (while recognizing the need to link this to future social, cultural and economic circumstances). With workshop participants and others, the Chief Forester committed to carry out a high-level analysis of concepts and recommendations arising from the workshop and making the results available in February 2006, and to incorporating the results of the analysis into work plans.

The Chief Forester stated his vision for forest management in BC is that:

> *British Columbia is widely respected as a leader in the management of natural forest and range landscapes to maintain diverse values and provide an array of products that are valued in the marketplace.*

Key themes that emerged from the workshop included:

- Emergence of a new framework or model for managing that carries forward the best attributes of our current approach, but is better able to deal with the uncertainty and risk inherent in making decisions today that have consequences for decades to come.

Some common messages included:

- The need to adopt a principle of managing for resilience of systems (where diversity begets resilience);
- Building adaptive management into forest management practices and decision-making models as an essential strategy for dealing with uncertainty;
- Need to constantly track the interactions between changes to ecosystems, human communities and economies and respond with a mind to balance and resilience.

Some highlights from Working Group Discussions include:

- Move toward managing for variability and away from our current focus on simplicity,
- Provide incentives for ecosystem modeling and adaptive management in new forest management models. (Note: likely need for TEM/PEM)
- Move away from arbitrary thresholds (e.g., free-to-grow) to more flexible approaches
- Close the gap between LRMP level plans and FSPs or similar plans with comprehensive forest-level (multiple landscape) spatially defined plans. (Note: this can be provided in a SFMP) (Note: likely need for more accurate stand-level information to support spatially defined plans; and need for seamless coverage to address multiple landscapes such as TSA/TFL inventories).

Observation:

- It seems the flavor of the workshop was less oriented towards defining future forest conditions (e.g., using indicators and targets) given the many uncertainties that we likely face due do change agents (like global warming, forest health, fire, etc) --- but more that we should design our new regenerated forests today to be more resilient to change agents by encouraging diversity and discouraging simplicity in our future forests.

- This requires a shift in thinking from meeting stand-level rules (like free growing) to assessing overall forest conditions at the landscape and management unit level – and making stand-level decisions in that context that promotes diversity. (Note: need to report on the status of forests using inventories over broad landscapes)

SFMP can address long-term values in 50 to 100 years associated with future forests, address forest conditions now and in the future at the landscape level, and other forest values important to communities and First Nations. (Note: need to project or model inventory over time)

One project associated with the Future Forest initiative is tree species composition and diversity. The Chief Forester and MOFR executive have asked Pat Martin, Forest Practices Branch, to explore alternative policy options in developing and implementing targets for tree species diversity. The development and tracking of science-based targets will undoubtedly involve an analysis of the forest inventory and related information systems such as RESULTS.

8. Other initiatives[3]

Other initiatives that could be reviewed with respect to forest inventory implications include:

- FRPA Resource Evaluation Program (FREP)
  www.for.gov.bc.ca/hfp/frep/index.html
- Streamlining Forest Information Project
  www.for.gov.bc.ca/hfp/streamlining/index.htm
- Business Information Management Group (BIMG)
  http://srmwww.gov.bc.ca/rib/bimg/
- FRPA/FSP information support efforts www.for.gov.bc.ca/code/

[3] Further material will be added to this section in a later draft.